

What is claimed is:

1 1. A charge pump device for supplying a step-up voltage to a host,
2 the device comprising:

3 a charge pump part constructed with first to nth unit charge
4 pumps; and

5 a multi-level detector for detecting a level of a step-up voltage to
6 selectively drive the unit charge pumps in accordance with an amount of
7 power consumption of the host and thereby outputting at least one level
8 detection signal.

1 2. The charge pump device of claim 1, further comprising:

2 an oscillator for producing a pulse signal in accordance with the
3 level detection signal of the multi-level detector; and

4 a logic operation part for performing a logic operation on the
5 pulse signal of the oscillator and the level detection signal produced from
6 the multi-level detector, and outputting the operated signal to the charge
7 pump part.

1 3. The charge pump device of claim 1, wherein the first unit
2 charge pump is always driven by the level detection signal output from
3 the multi-level detector.

1 4. The charge pump device of claim 1, wherein all of the first to
2 nth unit charge pumps are driven when the amount of power

3 consumption by the host is high.

1 5. The charge pump device of claim 1, wherein the second unit
2 charge pump is driven when the amount of power consumption by the
3 host is low.

1 6. The charge pump device of claim 1, the multi-level detector
2 includes:

3 a voltage distributor for dividing a step-up voltage into first to nth
4 voltage levels; and

5 first to nth level detectors for comparing the first to nth voltage
6 levels to a reference level.

1 7. The charge pump device of claim 1, wherein each of the first to
2 nth level detectors includes a differential amplifier.

1 8. The charge pump device of claim 6, wherein the first voltage
2 level is lower than the reference level.

1 9. A charge pump device associated with a host, comprising:
2 a charge pump part including first to nth unit charge pumps;
3 a multi-level detector detecting a level of a step-up voltage so as
4 to selectively drive the unit charge pumps in accordance with an amount
5 of power consumption of the host;
6 a signal generator producing a pulse signal in accordance with a

level detection signal of the multi-level detector; and

a logic operation part operating on the pulse signal of the oscillator and a level detection signal produced from the multi-level detector, and thereby outputting an operated signal to the first to nth unit charge pumps.

10. The charge pump device of claim 9, wherein the multi-level detector includes:

a voltage distributor for dividing a power source voltage into first to nth voltage levels; and

first to nth level detectors detecting a plurality of levels of the step-up voltage by comparing the first to nth voltage levels divided by the voltage distributor with a reference level.

11. The charge pump device of claim 10, wherein each of the first to nth level detectors includes a differential amplifier.

12. The charge pump device of claim 10, wherein the first voltage level is lower than the reference level.

13. The charge pump device of claim 9, wherein the first unit charge pump is always driven by the level detection signal output from the multi-level detector.

14. The charge pump device of claim 9, wherein all of the first to

2 nth unit charge pumps are driven when power is turned on the host or
3 the amount of power consumption by the host is high.

1 15. The charge pump device of claim 9, wherein the second unit
2 charge pump is driven when the amount of power consumption by the
3 host is low.

4 16. The charge pump device of claim 9, wherein the logic
5 operation part performs a NAND operation on the pulse signal and the
6 level detection signal.
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8 17. The charge pump device of claim 2, wherein the logic
9 operation part performs a NAND operation on the pulse signal and the
10 level detection signal.
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